NEWFIELDS

TO: Chris Eustice, Phil Harrigan, NMED

FROM: Mark Lewis, Joe Allen, Brian Hansen, NewFields Boulder

DATE: September 8, 2006

SUBJECT: Discussion Draft of Ecological Remedial Action Objectives for Chino Mines Site

[NewFields Project No. 0473-002-900]

As we discussed, NewFields prepared a set of preliminary Remedial Action Objectives (RAOs) to help guide the New Mexico Environment Department (NMED) in assessing the direction and needs for risk management decisions and feasibility study. The following is a preliminary draft of text that briefly summarizes the basis for RAOs, and describes preliminary RAOs. The preliminary RAOs are presented for NMED review, and to stimulate discussion on risk management needs for the site.

Please don't hesitate to call if you have any questions or comments. We look forward to discussing the RAOs with you in the near future.

DRAFT RAO TEXT:

In conjunction with the RI/FS process for the Chino Mine Site Administrative Order on Consent (AOC), an ecological risk assessment (ERA) was performed to evaluate the potential for significant adverse effects on biological receptors in the Investigation Units (IUs) named in the AOC, and for the Ecological IU which is a site-wide unit.

RAOs consist of medium-specific or operable unit-specific goals for protecting human health and the environment. The objectives should be as specific as possible but not so specific that the range of alternatives that can be developed is unduly limited (USEPA 1988). The RAOs addressed below are specifically focused on the Smelter and Tailing Soils Investigation Units (S/TSIUs). These RAOs do not specifically prescribe cleanup criteria but rather provide a framework for prioritizing remedial alternatives that address the results of the ecological risk assessments for the S/TSIUs.

The Baseline Ecological Risk Assessment (BERA) confirmed that concentrations of metals are elevated in soils, surface water, and biota in significant some areas of the S/TSIUs. Areas closest to the main sources (i.e., the Hurley Smelter and tailing impoundments) contain the highest concentrations of copper and other metals that are enriched in source materials relative to background geologic concentrations. Soil pH is also lower (i.e., more acid) than natural conditions in the area, with the lowest pH in areas nearest the smelter.

The BERA confirms that the combination of elevated metal concentrations and lower pH result in increased risk of toxicity to aquatic and terrestrial ecological receptors that are

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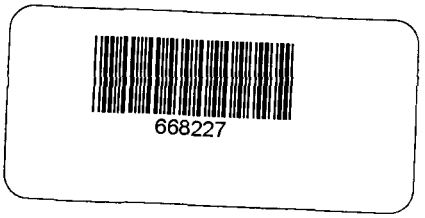

exposed to affected areas. If sufficiently widespread, toxicity could impair ecological function by affecting the sustainability of populations, and the viability of elements of the ecosystem that are sensitive to toxicity of metals and/or decreased pH.

Source Control

Release of windblown tailing material and smelter emissions into the S/TSIUs should be controlled to prevent additional contamination of the area with materials containing elevated concentrations of metals, or that will exacerbate depressed pH conditions in soils, sediments, and surface water.

Wildlife Risk

Risks to wildlife include direct and indirect effects. Direct effects include exposure of wildlife to elevated metal concentrations in abiotic median, water, and food. Indirect effects include degradation of habitat by toxicity to elements of wildlife habitat including structural elements such as vegetation for shelter or nesting, or food sources including vegetation, invertebrates, small mammals, and aquatic organisms.

To manage impacts of direct effects, remedial actions should prevent the ingestion of copper or other site-related metals by the small ground-feeding bird receptor (as defined in the BERA) at levels that result in unacceptable population-level risks. Based on results of the BERA, small ground-feeding birds represent the most-exposed wildlife, and potentially more sensitive receptors discussed in the BERA. Protection of small ground-feeding bird populations is assumed, therefore, to be protective of all wildlife populations within the S/TSIUs.

To manage impacts of indirect effects, toxicity to vegetation or other biological elements of habitat should be reduced to levels that allow for a self-sustaining ecosystem and prevent adverse impacts on local wildlife populations or subpopulations. In areas where habitat function is degraded due to toxicity of elevated copper concentrations and/or decreased pH from either smelter emissions or contamination released from tailings impoundments remedial actions should focus on the restoration of wildlife habitat. Remedial actions should provide a net benefit to the overall function of the ecosystem and provide for the restoration of habitat function through revegetation with native plant species.

Remedial actions should also ensure that contaminant conditions do not change so as to threaten wildlife populations and vegetation communities. Risk management actions to protect wildlife and wildlife habitat should recognize the impacts of other land-uses such as grazing.

Aquatic Life

Remedial actions should restore water quality, at a minimum, to water quality objectives that are protective of beneficial uses within a reasonable timeframe and maintain existing water quality that complies with water quality objectives. Remedial actions

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should reduce the likelihood of contact between surface water and soils/sediments that contain heavy metal contaminants at concentrations that could cause deleterious effects to aquatic receptor populations. Aquatic receptors include fish in areas where stream flow and/or aquatic habitat persists throughout the year or areas that fish may access during periods of adequate water levels (e.g., Lampbright Draw). Aquatic receptors also include taxa such as amphibians which depend upon aquatic habitat for breeding or certain life stages. Such species inhabit temporary or permanent water bodies in drainages or low-lying areas.

Risk management actions for protecting aquatic habitat should recognize the ephemeral nature of streams and land-uses in the project area.

Reference Cited

USEPA (United States Environmental Protection Agency). 1988. Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA. Interim Final. EPA/540/G-89/004OSWER Directive 9355.3-01. October 1988.

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